

BIKES
THAT
REALLY
MATTER
THIS
MONTH

ANCILLARY COMPONENTS

Designing and machining all the brackets, covers, fasteners etc took 2500 hours. Yes, 2500.

TANK

This is CNC machined from solid and has a 2.4mm wall thickness. Time to design and build: 700 hours.

AIRBOX

This is 3D printed, along with tank styling cowls and rear body work.

SWINGARM

This is from a 2016 Triumph Speed Triple, as is the saddle. The gearbox and clutch are from a ZZ-R1100.

CRANKSHAFT

Made from a 65kg billet of Assab 718 steel.

SPECIFICATION

Price: TBA
Engine: oil and air-cooled 1200cc parallel twin, tungsten 1/2-stroke balancer piston
Power: 100bhp+
Torque: 80 lb.ft+
Wet weight: 210kg



FRAME

It's a hollow backbone machined from solid aluminium that loops over the engine. It took 900 hours to design and make – more than most award-winning custom bikes.

'You could argue the Engrich's 1200cc parallel twin is more extraordinary than Britten's V-twin'



[A BRITTEN FOR THE 21st CENTURY]

Inspired by Britten... and Britain

This Engrich ART 1200 is part classic Brit twin and part John Britten-inspired genius

When details of John Britten's astonishing V1000 surfaced in the late 1980s, the motorcycle world was stunned. The New Zealander and his mates hadn't just built a bike, they'd designed and created a cutting edge engine too. Minds were blown. And, nearly 30 years later, it's happened again: another handful of New Zealanders in a shed, another ground-up engine design in an all-new motorcycle.

In fact, you could argue the Engrich's 1200cc parallel twin is even more extraordinary than John Britten's race-winning V-twin because it features an innovation that's never been seen in a big twin before – a reciprocating balance piston with half the crank throw, rather than a dummy con-rod as used by BMW's F800. This means despite being a 360-degree twin (ie both main pistons go up and down together), the Engrich is almost perfectly smooth.

'You notice the smoothness most at idle,' says Leigh Richardson, one of the Engrich's four creators. 'When a normal 360 twin would be shaking about, it just sits there with no vibration at all. It's still got the traditional British exhaust note because the firing order is the same, but without the vibes.'

The Britishness extends beyond the exhaust – the balancer idea came from Bert Hopwood, who designed numerous classic Brit twins. Leigh's co-conspirator John Appel had read a book by Hopwood that discussed the idea and he mentioned it to Leigh. It was perfect timing – Leigh had

packed in racing and was looking for another challenge.

'There was no more discussion than that,' says Leigh. 'John wanted to remove all the inherent problems of a 360-degree twin and me, my dad and Peter Thompson were looking for an engineering project.'

'We started in 1999 and spent the first five years doing engine CAD designs. We were working in the evenings, studying crankshaft design, doing stress analysis. It wasn't until 2007 that we could think about sand casting the engine because that was when I got access to CNC machinery when I got a job in the UK.'

Another reason for the extended timescale was that the team had no engine building experience. 'We had to learn new skills at every stage – engine design, casting, material science, CNC machining...'

Then Leigh got a job as an engineer at Triumph, working on the 2012 Daytona 675 engine. 'Without the Triumph job I don't think we'd have finished our project. The level of understanding you get when you have time and money to go into detail is amazing. And the experience and knowledge of Triumph is extraordinary.'

Leigh returned to New Zealand in 2013 to finish the engine and start work on the chassis. 'The tank alone took 700 hours. There are 11 parts, five for the outer, six inside, all TIG welded together. Each of the two big segments were made from 80kg blocks of aluminium. It's an absurd way of doing it but a carbon tank was ruled out by regulations.'

With the bike finished, Leigh is now looking into low volume production, just as John Britten did three decades ago. Britten died in 1995, but his memory lives on in projects like the Engrich: 'He was a massive inspiration for us – him building the V1000 got us thinking, maybe we could build an engine,' says Leigh. 'Mind you, we thought it would take two or three years, rather than half a lifetime.'